PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 95-553-PCT	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US95/14844	International filing date *(day/month/year)* 13 NOVEMBER 1995	(Earliest) Priority Date *(day/month/year)* 15 NOVEMBER 1994
Applicant FORMFACTOR, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. [ ] **Certain claims were found unsearchable** (See Box I).

2. [ ] **Unity of invention is lacking** (See Box II).

3. [ ] The international application contains disclosure of a **nucleotide and/or amino acid sequence listing** and the international search was carried out on the basis of the sequence listing
   - [ ] filed with the international application.
   - [ ] furnished by the applicant separately from the international application,
     - [ ] but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
   - [ ] transcribed by this Authority.

4. With regard to the title,
   - [X] the text is approved as submitted by the applicant.
   - [ ] the text has been established by this Authority to read as follows:

5. With regard to the abstract,
   - [ ] the text is approved as submitted by the applicant.
   - [X] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is:
   Figure No. 5
   - [ ] as suggested by the applicant.
   - [X] because the applicant failed to suggest a figure.
   - [ ] because this figure better characterizes the invention.
   - [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/14844

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G01R 1/073;B23K 31/02
US CL :324/754,761; 228/180.5
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 324/757,758,762; 439/91, 912; 427/96,117; 428/601,626; 29/840,843; 361/785

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US, A, 3,832,632 (ARDEZZONE) 27 August 1974, see columns 3 and 4.	1-7 --- 8-33
Y, E	US, A, 5,471,151 (DIFRANCESCO) 28 November 1995, see columns 9 and 10.	8-33
A	US, A, 5,148,103 (PASIECZNIK, JR.) 15 September 1992.	34-36
X	US, A, 4,983,907 (CROWLEY) 08 January 1991 see columns 3 and 4.	35-36
X	US, A, 5,187,020 (KWON ET AL) 16 February 1993, see columns 3-5.	37-42

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier document published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search 14 MARCH 1996	Date of mailing of the international search report 23APR1996
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ERNEST F. KARLSEN Telephone No. (703) 305-4768

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Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

A probe card assembly (500) includes a probe card (502), a space transformer (506) having resilient contact structures (probe elements) (524) mounted directly to and extending from terminals (522) a surface thereof, and an interposed (504) disposed between the space transformer (506) and the probe card (502). The space transformer (506) and interposer are "stacked up" so that the orientation of the space transformer (506), hence the orientation of the tips of the probe elements (524), can be adjusted without changing the orientation of the probe card (502). Suitable mechanisms (532, 536, 538, 546) for adjusting the orientation of the space transformer (506), and for determining what adjustments to make, are disclosed. Multiple die sites on a semiconductor wafer (508) are readily probed using the dislcosed techniques, and the probe elements (524) can be arranged to optimize probing of an entire wafer (508). Composite interconnection elements (200) having a relatively soft core (216) overcoated by a relatively hard shell (218, 220) as the resilient contact structure are described.

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

APS
s space transformer and 324/class
s space transformer and interposer
s (interposer or space transformer) and resilient
s (interposer or space transformer) and resilient contact?
s (planarization or planarize or planarizing) and tip and 324/class
s resilient contact ? and composite